

New Helpful Hints for Autoists

Tire Inspection Made Easy—Sewing a Tube—Other Ideas

INSPECTING the inside of an automobile tire for nails or breaks in the fabric is made easier by the simple, homemade device sketched in Fig. 4. Plenty of leverage is supplied for spreading the beads.

All you need to make the device is two boards of the dimensions given in the sketch, a hinge, two eyebolts and two strap iron hooks six inches long. The distance between the hinge and the eyebolt in the base should be about ten inches, and the eyebolt on the lever should be six inches from the hinge. Use standard strap iron for making the hooks.

Stops Crank-Handle Rattling

THE easiest way to hold the crank handle up out of the way of the license plate and to keep it from swinging back and forth continually and thus causing excessive wear on the bearing, is to cut off a piece about $1\frac{1}{4}$ inches wide from a piece of old inner tube either 29 by 4.40 or 32 by 4 size. After the lamp plug is removed from one of the headlights, the piece of inner tube should be slipped over the headlight and snapped around the crank handle as shown in Fig. 2. The quality of the rubber in auto inner tubes is so good that the band will last for a long time.

Sewing Up a Blow-Out

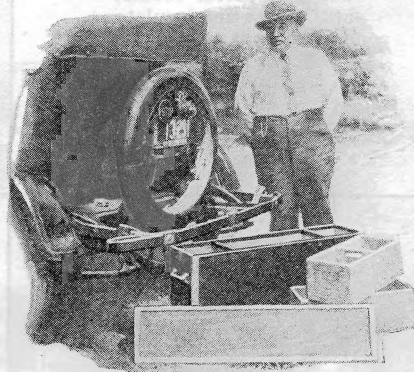
MANY motorists are under the impression that a tube is beyond repair if it blows out in a long rip. However, it is possible to save such a tube by sewing up the rip carefully with a needle and silk thread, using an overstitch that will bring the edges of the rent together smoothly. A patch can be applied with rubber cement in the usual way, and it is also possible to vulcanize the tube with a five minute vulcanizer by using the oblong patches and overlapping them until the rip is completely covered. Fig. 7 shows how to sew up the tube and apply the patch.

Luggage Stored on Top

AS SHOWN in Fig. 3, the top of an inclosed auto body can be used as a fine luggage compartment

that will hold extra coats, blankets or parcels and preserve them from dirt and rain. It is particularly useful for motor campers and long distance tourists.

The construction is very simple.



Plywood and aluminum make this lunch kit light and strong. Fig. 1 (below) shows how it is fastened in place

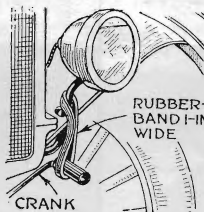
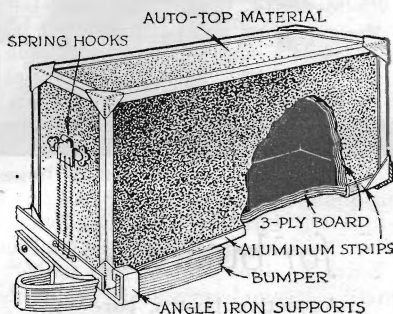


Fig. 2. How the crank handle can be held up out of the way so it will not rattle or hide the license

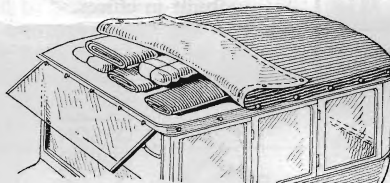


Fig. 3. The top deck of a closed car converted into a fine luggage compartment by fitting with a loose cover provided with snaps

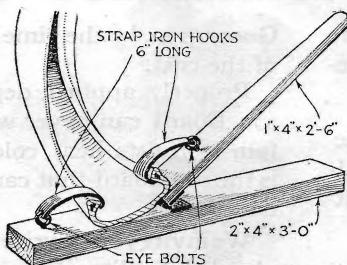


Fig. 4. Plenty of leverage enables you to inspect every part of the inside of an automobile tire with this simple device

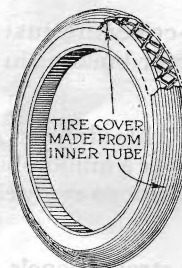


Fig. 5. An old inner tube will disguise your new spare tire so it will look old

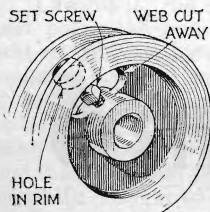


Fig. 6. If your fan pulley slips, hold it with special set screw

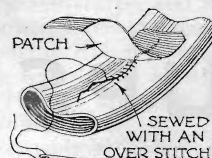


Fig. 7. Careful sewing will often save a blown-out auto tube

Ten Dollars for an Idea!

D. A. JEWETT, of Beaver City, Nebr., wins the \$10 prize this month for his suggestion of a device to make tire inspection easy (Fig. 4).

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this type is more suitable for such articles as rolled-up blankets, tents or other items that have no hard, sharp corners to scratch the material of the top.

Plywood Lunch Kit Easily Made

A SUBSTANTIAL container for picnic lunches or campers' equipment can be made of three-ply wood, glued and nailed and covered with auto top material to render it waterproof. As shown in Fig. 1, it is bound with aluminum binding strips and aluminum corners so that the construction is light and strong. Snaps, handles, loops and springs are of the ten cent store variety. A feature of the container is the springs that hold the case on the special rack built up of angle iron and supported by the rear bumper. No straps are needed and the case can be removed in a second's time.

Old Tube Fools Thieves

AN OLD inner tube that you may have on hand will make a good cover for the spare tire (Fig. 5). At a distance of a few feet it gives the appearance of an old tire that is worn smooth or has been retreaded, and thieves are likely to pass it by. Cut the stem out of the old tube and slit it all the way around. The tension in stretching it into place over the shoe will make it fit snugly without wrinkles.

If Your Fan Pulley Slips

IF YOU are bothered with a fan pulley that keeps working loose, here is a way to remedy the trouble. Cut away part of the web as shown in Fig. 6 and drill and tap the hub for a hardened set screw. The pulley will stay in

place. It is a good idea to spot the shaft with a drill through the set screw hole when the pulley is in the proper position to insure rigid clamping.

A row of snap fasteners should be placed at intervals around the edge of the top. A piece of auto top material can be cut to the proper shape and the socket part of the fasteners attached to it. Be sure to have the cover loose enough so that there will be room for as much baggage as you intend to place under it.

Of course a luggage compartment of

KINKS for the Auto Handyman

Disappearing Luggage Carrier, Dent Remover, Other Ideas

WHILE a wheel puller is the proper tool with which to remove a rear wheel that is tightly jammed on the tapered end of the axle, sometimes you find you must do the job without the necessary special tool. Fig. 1 shows a way to get the wheel off by means of a tire chain and the jack. After the hub cap and locking nut have been removed, the tire chain is looped around a couple of spokes and the end of the jack is placed with the foot against the axle and the elevating step in the loop, so that working the jack lever exerts pressure directly in line with the axle. Make sure that the chain is fastened securely.

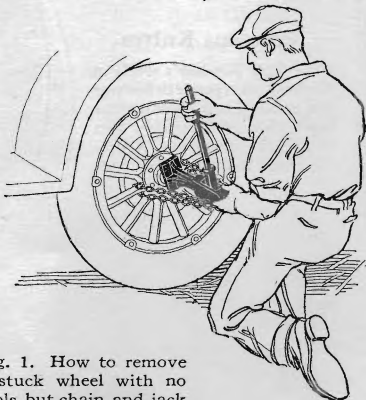


Fig. 1. How to remove a stuck wheel with no tools but chain and jack

Pole Holder for Car Fender

ABOUT the most awkward object to carry in an auto is a long pole. It won't fit inside the body, of course, and when strapped on the side scrapes off the paint. A solution of this problem is to make a pair of brackets as shown in Fig. 3 and clamp them to the fenders. A single bolt will hold each bracket in place, and if felt is glued to the part of the bracket that comes in contact with the fender, there will be no scratching. The brackets can be made of steel of any dimensions, depending on the strength required.

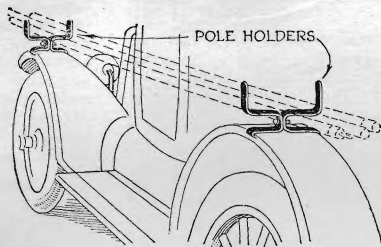


Fig. 3. These special fender pole holders will permit you to carry long poles on your car without scratching the paint

Simple Dent Remover

IT IS possible by the skilful use of a hammer to remove dents in a rim of the type used for straight side tires, but the work is simplified by the use of the tool shown in Fig. 7. A piece of an old spring is first heated to draw the temper, and after a slot has been filed in it it should be retempered. After hardening, draw the temper to a deep straw color.

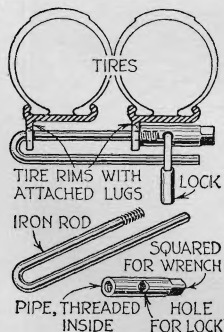


Fig. 6. Two bolts like this, one without the lock, will permit carrying an extra spare tire

To Outwit the Gasoline Thief

THE tourist and auto camper often finds his gas tank mysteriously empty after a night spent in a strange camp or if the car has been stored in a strange garage. Petty thievery of this kind can be stopped by fitting a lock to your gas tank filler cap as shown in Fig. 2. The hasp and hinge are cut out of heavy sheet iron. The staple is obtainable in a hardware store. Bend the end of the hinge so that

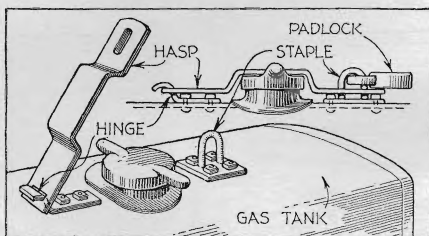


Fig. 2. Locking your gasoline filler cap in this way will prevent those mysterious losses of gasoline that sometimes occur on motor tours

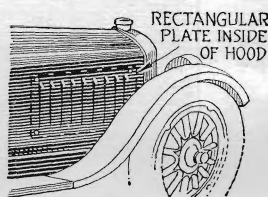


Fig. 4. Metal or plywood plates fastened to the inside of your hood as shown will help keep the motor warm when the car is left standing

Keeps Motor Warm

ARADIATOR cover of the conventional type serves to regulate the amount of air that flows through the radiator while the car is in motion, but it cannot keep the motor warm for very long when the car is standing, owing to loss of heat through the openings in the side of the hood which permit the air to circulate freely. Metal or plywood plates bolted on the inside of the hood as shown in Fig. 4 will stop this

waste and also help to keep your feet warm by driving the heated air back through the openings in the floor boards.

Luggage Carrier Folds Out of Way

THIS novel homemade luggage carrier (Fig. 5) is made so that it folds underneath the running board when not in use. Three large sized strap hinges are bent as shown, and screwed to the under side of the running board. Wooden or light metal strips are fastened to the movable member of the hinges with short bolts. A leather strap at each end will serve to hold the carrier in the proper position when in use, and a special catch will hold it flat against the bottom of the running board when not wanted.

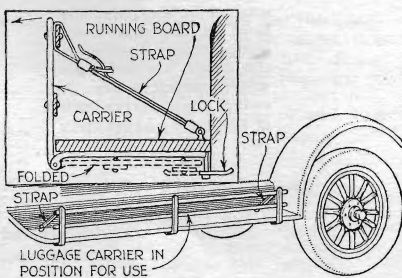


Fig. 5. A folding running-board luggage carrier like this is always handy when you need it, and yet it is out of the way when not in use

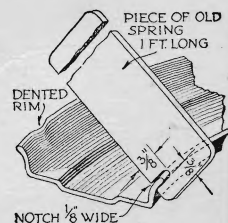


Fig. 7. Dents in your tire rim may be removed with surprising ease with this ingenious tool

Ten Dollars for an Idea!

GEORGE D. HUGO, of Seattle, Wash., wins the \$10 prize this month for his suggestion of the disappearing luggage carrier (Fig. 5). Each month POPULAR SCIENCE MONTHLY awards \$10 in addition to regular space rates to the reader sending in the best idea for motorists. Other published contributions will be paid for at usual rates.

Eight Useful Tips for Your Car

A Homemade Air Valve and Other Devices

Ten Dollars for an Idea!

R. BOETTINGER, of Union City, N. J., wins the \$10 prize this month for his suggestion of the homemade air valve (Fig. 3). Each month **POPULAR SCIENCE MONTHLY** awards \$10 in addition to regular space rates to the reader sending in the best idea for motorists. Other published contributions will be paid for at usual rates.

AN AUTOMOBILE valve spring is pretty stiff and requires a lot of energy to compress it. Here is a simple way to compress it and keep it in that position as long as desired without wearing out your muscles. As shown in Fig. 2, the bench vise supplies the leverage needed to compress the spring with great ease, and the small metal clip serves to keep it compressed. The spring should be set in the vise jaws to a point slightly past the center line of the spring, so that it will not bend out sidewise. Then screw up the vise and slide the spring from the vise into the clip. The clip can be cut out of sheet metal and bent into shape. The handle is not absolutely necessary, but is convenient.

Better Light in the Rain

YOU probably have noticed that your headlights do not seem to give nearly so much light when you are driving in the rain as on a dry night. This loss is due to the diffusion of the rain drops that collect on the glass. Each one acts like a tiny lens, and the rays that should be directed toward the road in front of you are refracted off in every direction except the right one. If you will wipe the glass of the headlights with a rag moistened with ordinary glycerin (Fig. 1), the rain will form a smooth layer.

Homemade Air Valve

A PROPERLY adjusted spring controlled air valve in the manifold between the carburetor and the cylinder head will materially increase your gasoline mileage. Fig. 3 shows how to make such a device from standard parts. An ordinary solderless union tee of the type used in gasoline lines forms the body. A light spring and a ball bearing of suitable size are placed in each end of the tee under the nut, which



Fig. 1. A simple way to increase light at night

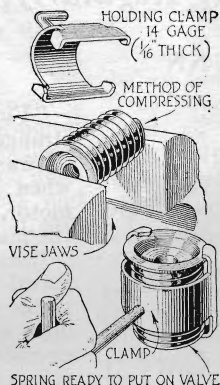


Fig. 2. This homemade holding clamp will prove useful when you have stiff valve springs



Fig. 5 (left). Wooden clip mounting for trouble light holds the light where needed. Fig. 6 (right). Simple anti-rattler for hood

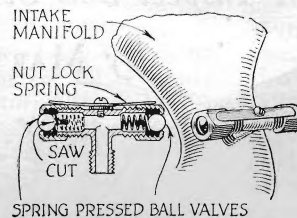
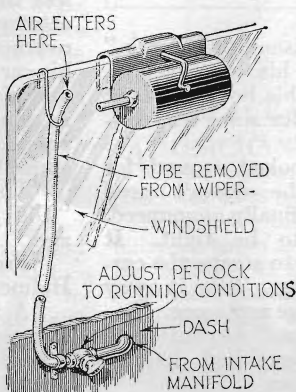


Fig. 3, above, shows how to make an automatic air valve to increase your gas mileage. Fig. 4 (left). Universal puller for auto wheels

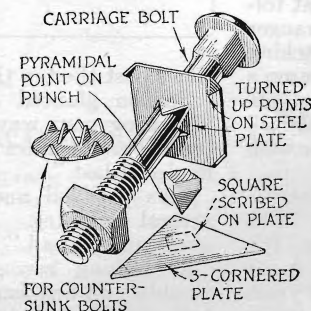
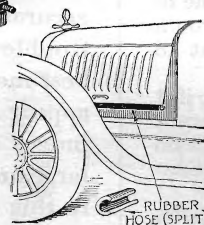
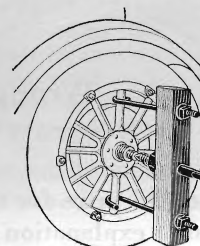


Fig. 7. Simple arrangement to obtain extra mileage on long runs

can be turned to adjust the tension of the spring. A flat spring screwed to the tee will keep the nuts from turning.

More Mileage on Long Runs

IF YOUR car is fitted with an automatic windshield wiper of the vacuum operated type, you can fit an auxiliary air inlet to get more mileage out of your gasoline on long runs. Connect a petcock in the rubber hose line leading to the wiper and on long runs you can pull the end of the hose off the wiper and allow extra air into the manifold by adjusting the petcock. Fig. 7 shows the arrangement.

Ingenious Trouble Light

A WOODEN clip of the type shown in Fig. 5 makes an excellent base for a trouble light. A socket of standard type should be attached to the clip as indicated. The clip will hold on to any small round object, such as a wire, or on to the edge of a sheet metal part.

Universal Wheel Puller

ANY type of wheel that is stuck on the end of a taper axle, regardless of the size of the threaded hub, can be removed with the wheel puller shown in Fig. 4. A section of 2 by 4 inch lumber is drilled with a hole at each end and in the center. Heavy rods are forged into the shape of a hook at one end and threaded at the other. A heavy bolt is pointed at one end for use in the center.

Holds Carriage Bolts

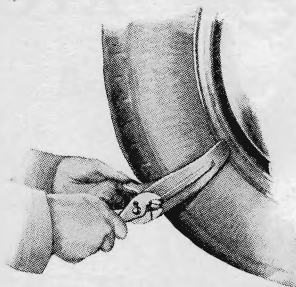
CARRIAGE bolts that have worn loose in the wood are not easy to tighten. Sheet metal lock washers of the type shown in Fig. 8 will hold the bolt stationary while the nut is being set up tight. A pyramidal point should be ground on the end of the punch so that a square hole can be punched in the center of the washer. Where there is plenty space, a piece of sheet steel can be used with the corners turned down to grip the wood.

To Stop Hood Rattling

THE fastening arrangements on the hood of the modern automobile usually hold it tight enough to prevent rattles, but when the fastenings wear, annoying rattles sometimes develop. A way to eliminate them is shown in Fig. 6. Take a piece of small size garden hose the length of the hood, split it with a knife and slip it over the lower edge of the hood.

Practical *New* Aids to Motorists

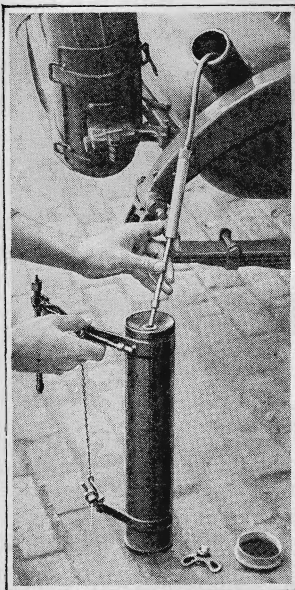
Syphon Oil Bottle, Gripper Mud Hook, Socket Wrench Set and Other Handy Time-Savers



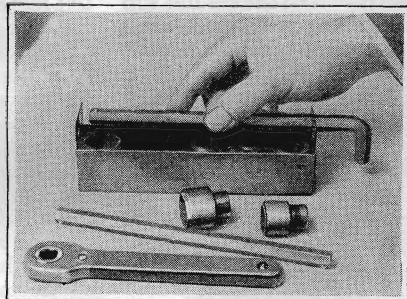
Here is a mud hook that will pull you out of a hole with ease. It consists of a heavy, ribbed cross member with hinged side arms controlled by a bolt, so that the hook can be clamped around the tire to the edges of the rim



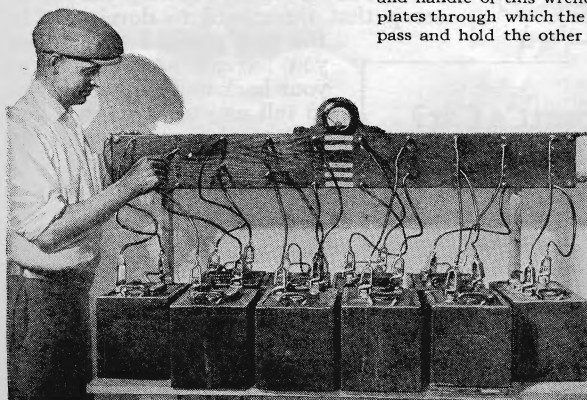
Spring oiling is a dirty, disagreeable job when it means crawling under the car with an old paint brush and a pail of waste engine oil. This new pressure oil container filled with a special penetrating oil makes the job easy and quick. A knurled wheel opens a tiny hole through which the oil is projected in a fine stream with so much force that it can be directed accurately from a distance of several feet, as above



One pull on the plunger of this special gasoline tank syphon starts a steady stream flowing into the tank of the camper's gasoline stove, or into a can to help out a stranded motorist



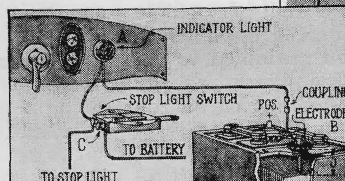
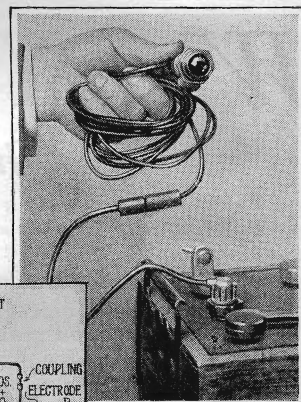
The metal tray into which the sockets and handle of this wrench kit fit has end plates through which the hexagonal pieces pass and hold the other parts in the tray



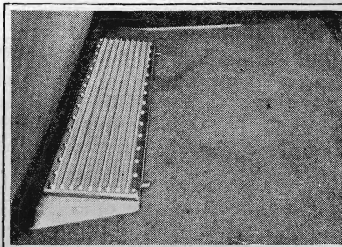
This new battery charging panel simplifies the work of the battery service station. Instead of using clips or knife switches, a row of jacks is provided with plugs on the cables. The upper row of jacks is connected directly to the constant voltage charging generator. The second row gives ammeter readings



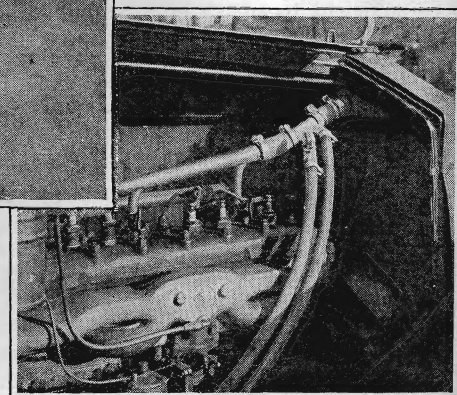
The tail-light of an automobile is in constant danger of damage because of its exposed position. Special tail-lights built of rubber with flexible celluloid-covered apertures (above) were shown at a recent auto exposition. The rubber is soft and flexible so that the tail-light bends when struck



Most automobile starting batteries are allowed to run low on water through forgetfulness on the part of the owner. This novel indicator automatically tells when the level is getting too low. When wired as shown in the diagram, the red light on the dash will flash on each time the brake is put on if there is still sufficient water in the battery. When the level falls too low, it no longer makes contact with the lead plug in the filler cap



Here is a new hot water heating system designed to supply even, uniform heat. The radiator is installed behind the front seat and connected by pipes to a fitting that takes the place of part of the top hose connection. A valve controls the flow of water



Seven Useful Kinks for Your Car

How to Solder Tank Floats, Build Clothes Compartment, Plug Leaks

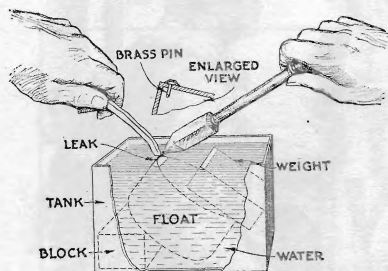


Fig. 1. Solder carburetor or vacuum tank floats in this way to make a tight seal

WHEN you attempt to solder up a leak in a carburetor or vacuum tank float, the heat of the iron causes the air inside the float to expand. The air pressure produced then forces bubbles of air through the hole you are trying to solder, making it very difficult to seal the hole. By immersing the float in a vessel full of water as shown in Fig. 1, this difficulty can be overcome. The water keeps the metal of the tank from heating up to any great extent, except at the point where the soldering iron is applied.

If there is a small hole in the tank instead of a crack at one of the seams, you will find that the soldering is much easier if you cut off an ordinary brass pin and push what remains of the shank through the hole as shown.

If the float is partly filled with gasoline, you can drive it out by supporting it with the hole down and heating the hot soldering iron close to it, without actually touching.

Protects Garage Padlock

ANYONE who has tried to unlock the padlock on the garage door after a freezing rainstorm, when the whole mechanism of the lock is frozen solid, will appreciate the simple method shown in Fig. 2 for keeping water and snow out of the padlock. An old section of inner tube can be cut in the shape indicated and tacked so that it covers the padlock. Note that the padlock is protected from the bottom by the folded and wired flap.

Ingenious Clothes Compartment

ON LONG motor tours or camping trips it is difficult to keep clothing in presentable condition because of lack of packing space. The space underneath the top of a closed car can be used as shown in Fig. 7. A piece of three-ply veneer is cut so that it fits loosely against the inside of the top. One edge is at-

Ten Dollars for an Idea!

TERRY W. BROWN, of Massillon, O., wins the \$10 prize this month for his suggestion of an auto clothes compartment (Fig. 7). Each month **POPULAR SCIENCE MONTHLY** awards \$10 in addition to regular space rates to the reader sending in the best idea for motorists. Other published contributions will be paid for at usual rates.

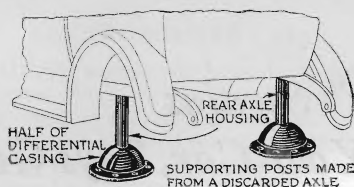


Fig. 3. Old axle supports frame when you have to remove rear axle

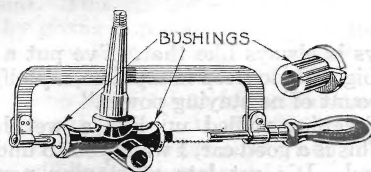


Fig. 4 (above). Hack-saw through side wall of your spindle body bushings and they can be driven out easily

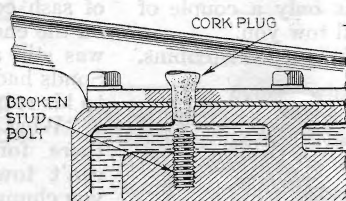


Fig. 6. A few corks in the tool box are handy if you break a bolt

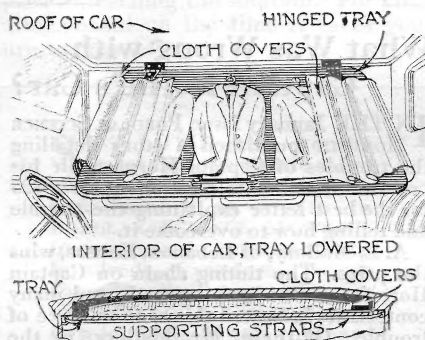


Fig. 7. Clothes tray for campers and tourists. It takes up little space under the top

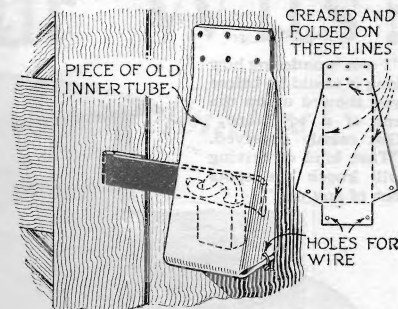


Fig. 2. This padlock cover will keep snow or sleet from jamming the padlock

tached by means of strap hinges as shown. On the underside of the other edge are fastened several large screw eyes. These act as buttons for short pieces of strap attached so that when the board is swung up there will be a space of two or three inches for clothes.

These Jacks Will Save Tires

FIG. 5 will show you how to make up simple tire-saving jacks so that you can get all four wheels off the ground in just a moment. A hole somewhat larger than the hub is cut in a piece of two by four, and a one and one-half-inch slot is sawed from one end to meet the hole. In this slot is fitted a short piece measuring slightly less than one and one-half inches wide. It should turn freely on the bolt. As you push the frame toward the car, the tire will be raised off the ground.

Removes Spindle Bushings

DRIVING out spindle body bushings is not so easy unless you have a special tool designed for this particular job. However, sawing through the sides of the bushings will greatly facilitate the work. Unclamp the blade from the hack saw frame and pass the blade through the king-pin hole and then fit it to the frame as shown in Fig. 4.

Save the Running Board

THE common practice on light cars of supporting the chassis of the car on the running boards when the rear axle is taken out is rather risky. The running boards are not designed to support so much weight. The ends of the two halves of a rear axle housing can be cut off to the proper length to form substantial frame supports as shown in Fig. 3.

Cork Will Plug Water Leaks

IF YOU are unlucky enough to break off one of the water manifold bolts so that there is nothing to stop the water in the system from draining away, you can plug the leak with a cork as shown in Fig. 6. A spare cork or two in the tool box may come in handy as a substitute for a petcock in the oil or gas system.

Seven Handy Kinks for Autoists

Window Screens, Luggage Carrier, Table, Other Ideas

YOU can lash considerable bulky luggage to the running board of your car by the use of a rope arranged as shown in Fig. 1. The eyes should be bent up from an iron rod at least one quarter inch in diameter. By loosening the screws, the eyes can be turned under the running board when not in use.

Secret Switch Foils Thief

WHEN properly installed, the switch shown in Fig. 3 is so well concealed that the auto thief will never find it. As you get out of the car, slip the brass plate into your pocket, leaving the two screw

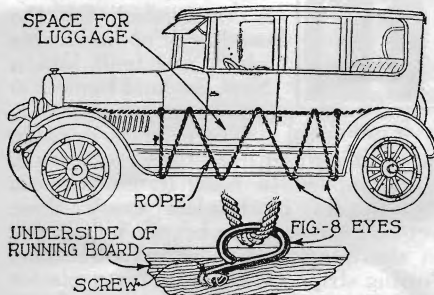


Fig. 1. Several special eyes and some rope arranged in this way will hold considerable luggage

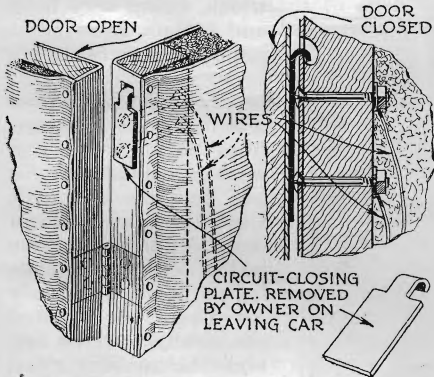


Fig. 3. Secret switch in ignition circuit to foil the automobile thief

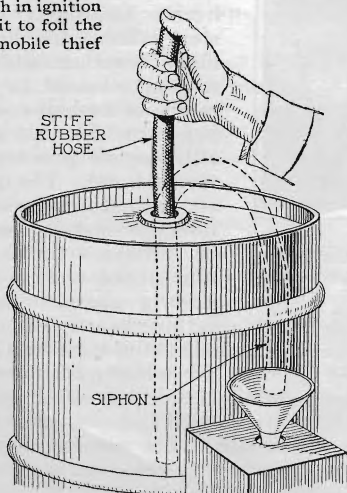


Fig. 4. To start the siphon, move hose rapidly up and down, applying thumb on the up stroke

Ten Dollars for an Idea!

PAUL KOSELKE, of Lansing, Ill., wins the \$10 prize this month for his suggestion of the auto window screens (Fig. 5). Each month **POPULAR SCIENCE MONTHLY** awards \$10 in addition to regular space rates to the reader sending in the best idea for motorists. Other published contributions will be paid for at usual rates.

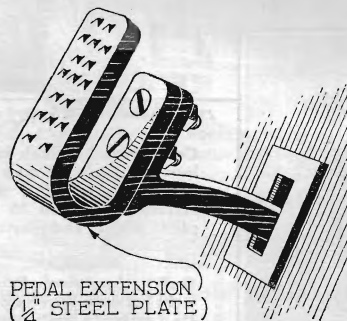


Fig. 2. A wrought iron pedal extension of this design is convenient, safe and easily made

heads exposed. The wires should be run inside the body lining so they will not show. If the sheet metal of the body extends over the surface where the screws are to be fastened, insulate the screws.

Novel Siphon Starter

YOU can start a siphon with a piece of hose as in Fig. 4. Push the hose down with a rapid motion, at the bottom of the stroke clamp your thumb over the end; pull up and repeat until the hose is full of gasoline. This stunt will work only with gasoline or other free flowing liquids.

Screen Your Car

FOR auto camping trips, screen at least two of the windows as shown in Fig. 5. The cross members are hinged so the screen can fold up. Cloth netting is used, the upper edge fastened with snap fasteners and the lower edge held in place by the window pane, which is cranked up against the lower edge of the screen.

Switch to Control Generator

TO CONTROL the output of the generator, you can install a switch on the instrument board and wire it in series with the third brush and one or two headlight bulbs arranged in parallel (Fig. 6). When the switch is on, the bulb is short circuited and the third brush functions as usual. When the switch is off, the bulb is

in series with the third brush and the output is increased.

Pedal Extension Easy to Build

SO LONG as cars are built to fit the average-sized person, the short man or woman will have trouble reaching the pedals. A strong, yet easily built extension can be built as shown in Fig. 2.

A Table for the Auto Lunch

FIG. 7 shows how to build a simple table that will prove useful for serving luncheon in the car. When not in use, it can be folded out of the way.

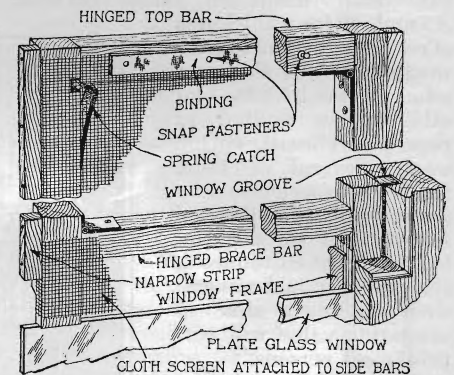


Fig. 5. Screens for at least two windows will add to your comfort when auto camping

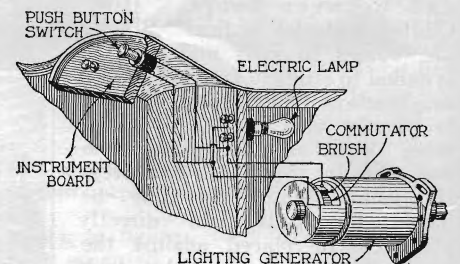


Fig. 6. You can change the output of your charging generator by using this arrangement

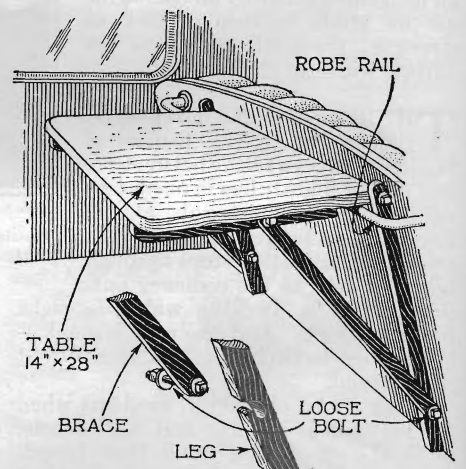


Fig. 7. A folding table that will prove handy on auto luncheon parties and is easily made

Handy Kinks for Motorists

Easy ways to oil springs and stop curtains flapping—Other useful ideas for your car

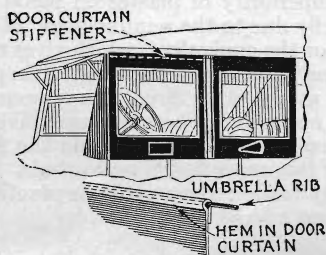


Fig. 1. How an old umbrella rib will stiffen window curtains and keep them from flapping in the wind

Ten Dollars for an Idea!

DR. J. W. AUSTIN, of San Jose, Calif., wins the \$10 prize this month for his suggestion of the whistle attached to the overflow pipe (Fig. 2). Each month **POPULAR SCIENCE MONTHLY** awards \$10 in addition to regular space rates to the reader sending in the best idea for motorists. Other published contributions will be paid for at usual rates.

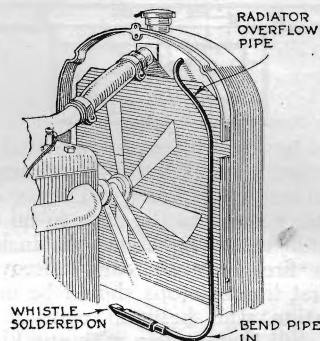


Fig. 2. Whistle soldered on the end of the radiator overflow pipe will give warning of overheated motor

WHEN the door curtains on your car begin to get old and floppy you probably will find that they sway in or out with each gust of wind and consequently afford little protection from the weather. An ingenious way to stiffen them is to open the end of the hem along the top and insert an old umbrella rib, as shown in Figure 1.

Whistle Indicates Boiling

YOUR motor always seems to over-heat and start boiling the water, if you have the misfortune to have it happen at all, at night when you can't see the thermometer on the radiator, or when, in the daytime, your attention is concentrated on the road or the scenery.

Of course, if you are going slowly in traffic the escaping steam will rise to warn you of trouble, but when you are traveling fast, you may not notice that something is wrong until serious damage has been done. A good way to make an infallible steam indicator is to solder a small whistle to the end of the overflow pipe, as shown in Figure 2. Day or night, the shrill blast of the whistle blown by the escaping steam will warn you to stop and investigate. A warning signal of this type is particularly valuable if your car is fitted with an automatic or hand-controlled radiator shutter. With the hand-controlled type, the whistle will blow and warn you to open the shutter if you happen to forget it.

New Battery Terminal Tool

FIGURE 3 shows a home-made tool that will prove effective in removing a battery terminal that is stuck fast to the lead post because of excessive corrosion. The device is a lever arrangement fitted with claws somewhat like those of a

hammer. Pressing down on the lever lifts up on the claws inserted under the cable clamp, and presses down on the post to which the clamp is stuck.

A Simple Spring Oiler

AS SHOWN in Figure 4, you can make an efficient spring oiler out of a piece of sheet iron, a broad lamp wick and a bolt. After you have cut a strip from the sheet iron long enough to reach a half inch or so below the edge of the spring on each side, place the strip on a piece of wood and with a center punch make a number of holes in the section that will cover the top of the spring. Then drill two holes, one at each end, fit the lamp wick in place over the spring, and bend

the sheet iron as shown in the illustration. Oil squirted on the top of the oiler will settle through the small holes at the bottom of the dents made by the center punch, and the wick will carry the oil down to the edge of each leaf.

Best results will be obtained if you fit two oilers on each spring, one on each side of the center fastening. If the springs are badly rusted, it is a good idea to mix a little kerosene with the oil.

An Emergency Hose Clamp

IF YOU happen to strip the threads on a hose clamp bolt so that it will no longer hold tightly, you can make a substitute out of a piece of wire and a large cotter pin, as shown in Figure 5. As you will note from the illustration, turning the cotter pin by means of a nail tightens the wire by winding it around the cotter pin. Ordinary galvanized iron or even copper wire will do.

In fitting a hose connection, it is a good idea to coat the end of the pipe with thick shellac before pushing the end of the hose on it, as shellac is insoluble in water, gasoline or oil and consequently will help make a tight joint.

Spiked Board Pulls You Out

ORDINARILY only one rear wheel gets stuck in a mudhole in the road. If the mud is very soft, even chains may not prove of much use. However, you will find that a length of board fitted with wooden cleats, and through which a number of long spikes have been driven, as shown in Figure 6, will provide a path for the wheel out of the hole. Another board nailed along the edge will prevent the wheel slipping off. When not in use it can be strapped under the running board.

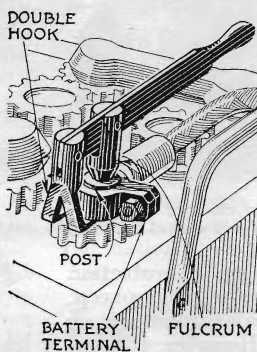


Fig. 3. Lever and hook device above is useful in removing corroded battery cable terminals

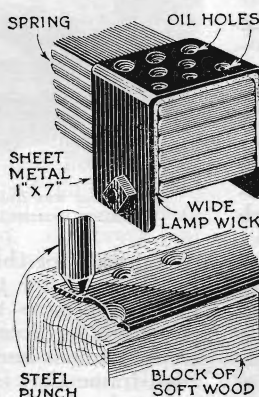


Fig. 4. Ingenious spring oiler made from a strip of sheet iron and lamp wick

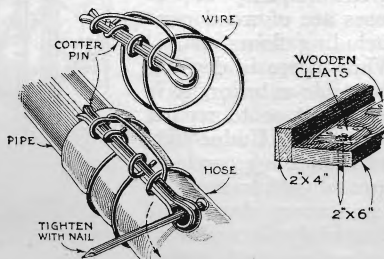


Fig. 5. Piece of wire and cotter pin makes hose clamp in an emergency

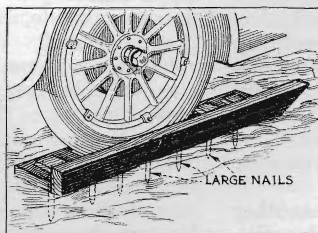


Fig. 6. A cleated and spiked board, with a guide rim along one edge, will help in getting your automobile out of mudholes

Kinks for the Motorist

Simple Ways to Make a Trouble Lamp, Wheel Puller, or a Baggage Rack—Ten Dollars for the Best Idea

O. E. Abernethy, of Hickory, N. C., wins the \$10 prize this month for his suggestion of a way to discourage the auto thief (Fig. 4). Each month POPULAR SCIENCE MONTHLY awards \$10, in addition to regular space rates, to the reader sending in the best idea for motorists. Other published contributions will be paid for at our usual rates.

Headlight Utility

THE socket in many types of auto headlights is a double-ended affair with the bulb plugged into the end inside the headlight and the supply wire from the battery plugged into the other. Such an arrangement permits you to obtain plenty of light for working on either side of the motor with very little trouble. Just remove the headlight rim, take out the bulb, and detach the supply wire. Now plug the bulb where the wire was and put the wire in the end of the socket inside the headlight. You may find it necessary to add a few inches to the length of the wire to make it reach around to the front of the headlight.

Old Tube Holds Luggage

THE rubber of which inner tubes are made is of the highest grade and, consequently, it is still springy and full of life long after it has been made useless as an inner tube by many punctures and blowouts.

Of course, it is easy enough to tie luggage on the back of your car with a piece of rope, but the arrangement shown in Figure 2 is much more handy and convenient, and in addition the elasticity of the rubber will keep the luggage tight so that it will not rattle after a few hard jounces. By making the loop of cord and inner tube somewhat smaller than the smallest package you are likely to carry, you will find that any bundle that will go on the luggage carrier can be held in place.

A Wheel Puller

SOME iron bars, a couple of heavy bolts and a piece of copper can be made up into a puller that will serve to remove the rear wheels of any car if the wheels are fitted on the end

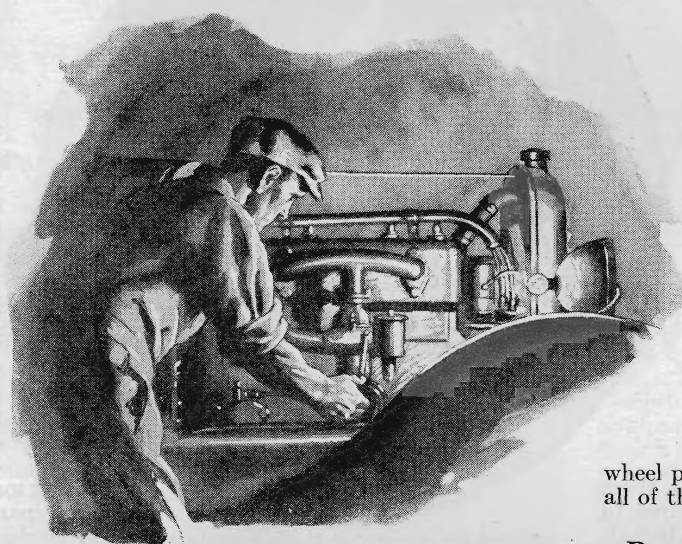


Fig. 1. Transposing headlight bulb and feed wire gives light to work on the motor

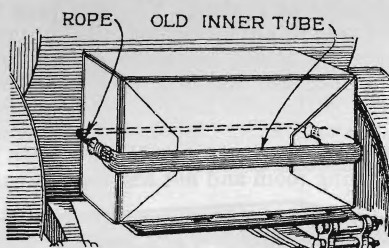


Fig. 2. Elasticity of an old inner tube holds packages tight on the luggage rack

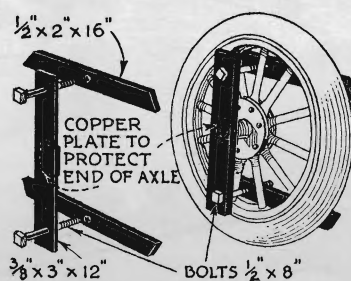


Fig. 3. Wheel puller made of iron bars, a piece of copper plate and two heavy bolts

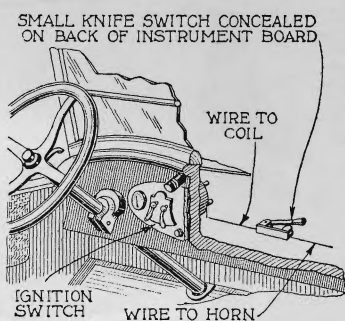


Fig. 4. Turning on ignition switch starts the horn sounding continuously, foiling the automobile thief

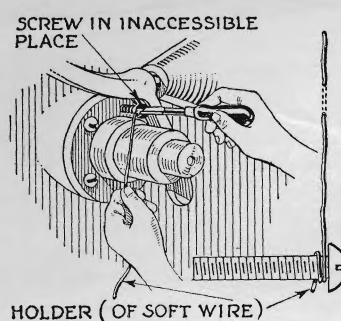


Fig. 5. Removing inaccessible screws is easy with a small piece of wire, as is replacing them afterward

of tapered axles. Figure 3 shows the construction and the dimensions of the iron bars. The copper plate should be riveted to the bar as shown to prevent injury to the end of the axle. After the bolts are set up tightly, the outside bar should be struck with a heavy hammer on the center over the end of the axle. This arrangement is particularly useful to the service man who may be called on to remove the wheels of cars of old style with odd sized hub cap threads. This

wheel puller transmits the strain through all of the spokes to the hub of the wheel.

Protection Against Thieves

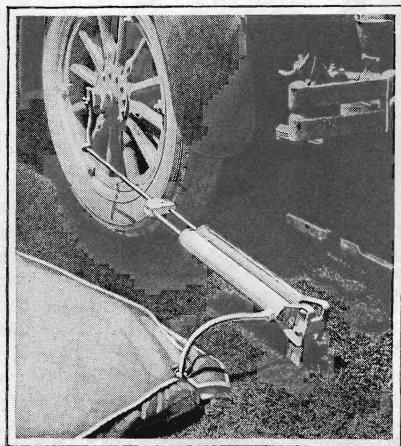
NOTHING is more disconcerting to an auto thief than a noise which will call attention to his activities, and so the simple wiring scheme shown in Figure 4 should prove quite effective while the car is left in a well populated district. All you need is a single pole, single throw knife switch and a few feet of wire. The knife switch should be concealed at any convenient point behind the instrument board. Connect one terminal of the switch to the binding post on the ignition switch, or to the wire that runs from the ignition switch to the spark coil, at any convenient point. Connect the remaining terminal of the switch to the binding post on the horn that is wired to the horn button, or to the wire itself if that is easier. When the switch is closed, turning on the ignition will cause the horn to sound.

Wire Loop Holds Screw

IT ALWAYS is easy enough to remove a screw from an inaccessible place provided you can get at it with the screw driver, but it is not so easy to replace the screw where it belongs after the job is finished. Often there is not sufficient space to hold the screw with the fingers or a pair of pliers. In such cases the job can be accomplished very easily by using a piece of fine wire as shown in Fig. 5. After the screw is started in the thread, the wire can be pulled off. A single strand from a piece of drop cord or ignition cable will serve for small screws. A light wire is best, as it can be pulled off easier after the screw is started in the hole.

Ideas You Can Use on Your Car

How to Double the Life of Tire Chains—A Wheel-Driven Pump for Campers—Other Ingenious Kinks



Engine Pumps Air Mattress

AFTER a day on the road the motor camper usually does not feel in the mood for the job of pumping up the air mattresses. By using two of the regular pumps supplied with the mattresses, arranged as shown above, you can make the auto engine do the work for you. The two pumps are fastened together and held by a hinge to a hardwood stake to be driven into the ground back of the rear wheel. The hub cap is prepared with two driving pins and a threaded stud. The rear wheel is jacked up and then the stake is driven at the correct distance. The length of the crank should be slightly less than half the total movement of the pump handle. The wheel should be run by the motor in low gear. Test the location of the stake by turning the wheel by hand. This is important, for if the stake is not located the proper distance behind the rear axle, the pump may be smashed. Of course the idea of using two pumps is to permit pumping up two mattresses at the same time.

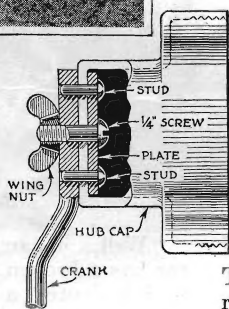


Fig. 1. By this arrangement the engine is used to pump up the air mattress

Ten Dollars for an Idea!

F. R. GORTON, of Ypsilanti, Mich., wins the \$10 prize this month for his suggestion of an air mattress inflating method (Fig. 1). Each month *POPULAR SCIENCE MONTHLY* awards \$10, in addition to regular space rates, to the reader sending in the best idea for motorists. Other published contributions will be paid for at the usual rates.

Windshield Wiper Holder

THE mechanism of your windshield wiper wears in after it has been in use for some months and then you will experience some bother because the jarring of the car will gradually move it down into your line of vision. To save yourself the annoyance of constantly pushing it up out of the way, add a spring clip as shown in Fig. 3. Then when you wish to use the wiper on rainy days, the end of the spring is slipped out from underneath the arm and it snaps away from the path of the wiper arm. If your wiper is different from that illustrated, change the shape of the spring to clamp under any convenient screw.

Emergency Valve Grinder

FIG. 2 shows a simple method of making a valve grinding tool that will do good work with minimum effort by the operator. A section of broomstick or an old shade roller is cut to the right length, slotted at the bottom and drilled for a cotter pin. The grinding blade can be filed out of a piece of scrap iron with two projections that will fit in the holes in your valves. Hold the bow at a slight angle so the rope will not chafe. More speed is had by a spring underneath that lifts it when the handle is raised.

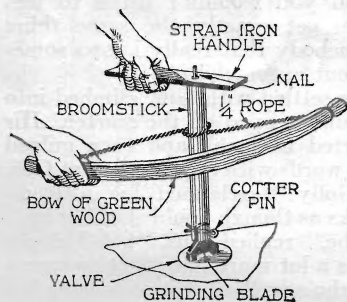


Fig. 2. This simple valve grinding outfit will do good work and is easy to make. The bow should have just enough tension to keep the rope taut

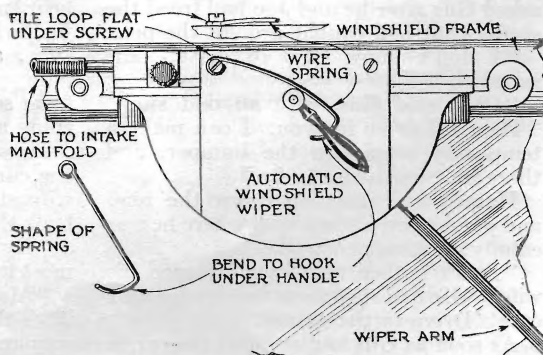
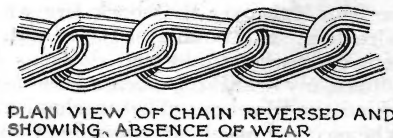
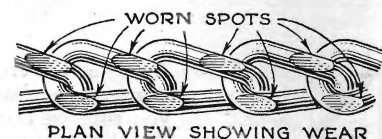
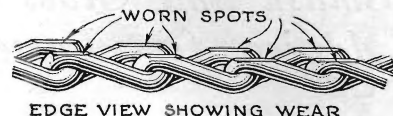


Fig. 3. The wiper on any of the vacuum types of automobile windshield wipers can be kept out of the way with a piece of spring wire bent as shown



Chains Last Twice as Long

IF YOU will examine your tire chains, you will find that the wear comes at the points indicated in the drawings above and, owing to the curve of each link, when you turn the chain over, the wear comes at a different point on the link. The worn spots will not harm the tire. As the life of a cross chain is terminated when the link wears all the way through, you can get practically twice as much wear out of a pair by reversing them every time you put them on. Make sure that the chains are fitted loose enough so that they creep around and around on the tire.

Simple Holder for Hats

EVEN in cool weather there are times when the occupants of a closed car desire to go without hats. This is particularly true during stormy weather when it is necessary to keep all windows closed. A simple holder that will keep any type of hat out of the way is shown in Fig. 4. A strip cut from an old inner tube is fastened to the top after a long slit has been cut down the center. There should be just enough tension to hold the hat in place without crushing. If desired, the hat holder can be stretched crosswise instead of lengthwise and two or more strips used instead of one, or it can be located on a side panel instead of the top.

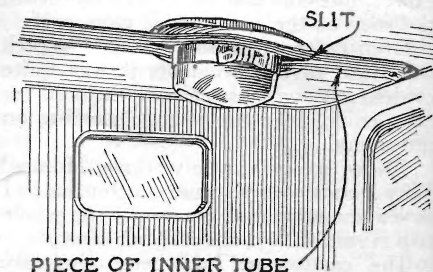


Fig. 4. A strip cut from an old inner tube can be made into a good hat holder as shown above. It will hold any type of hat without crushing it

Tricks to Improve Your Car

Piston Groove Cleaner; Tail-Light Guard; Accurate Painting Device; Other New Ideas

GOOD compression in a motor car engine cylinder depends on the fit of the rings in the cylinder and on the fit of the rings in the grooves of the piston. Many amateur auto mechanics fail on a ring-fitting job because they fail to realize the importance of piston ring fit in the cylinder grooves and the need for a clean groove that will permit the

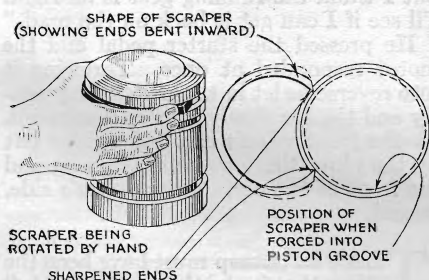


Fig. 1. A carbon scraper fashioned from an old piston ring makes an ideal tool to remove the carbon from the ring grooves in the piston

ring to operate without binding. Before you attempt to fit new rings scrape all carbon and gummed oil out of the piston ring grooves. A simple tool for this job can be made from an old ring. Grind or file off the ends until the remaining portion is about a third of a circle. Sharpen the edges as shown in Fig. 1 and you have a tool to remove the carbon with ease.

Dash Indicator Lights

INDICATOR lights fitted on your dash will tell you whether your tail and stop lights are properly burning. The wiring diagram of Fig. 2 shows how to fit and wire the indicator lights.

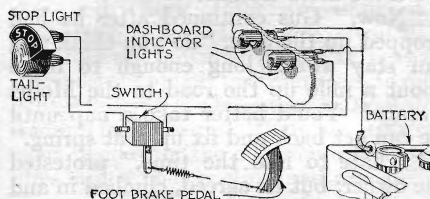


Fig. 2. Indicator lights on your dash board wired as shown may save you from being arrested and fined for not having tail-light lit

You can use ordinary dash lights of the type sold for automobile use, or you can get a pair of the jeweled indicator lights sold for radio use. The latter, fitted with jewels of the same color as the lights they indicate, will make a neat and attractive installation. The theory, of course, is that the indicator light is in series with the light it indicates and when either of the two bulbs in such a circuit burns out, the remaining goes out as well. Instead of 6-8-volt bulbs use $3\frac{1}{2}$ -volt bulbs.

Ten Dollars for an Idea!

C. A. Tubby, of Elizabeth, N. J., wins this month's prize of \$10 with his suggestion of a motor car painting device (Fig. 3). POPULAR SCIENCE MONTHLY awards \$10 each month, in addition to regular space rates, for the best idea for motorists. Other published contributions will be paid for at usual rates.

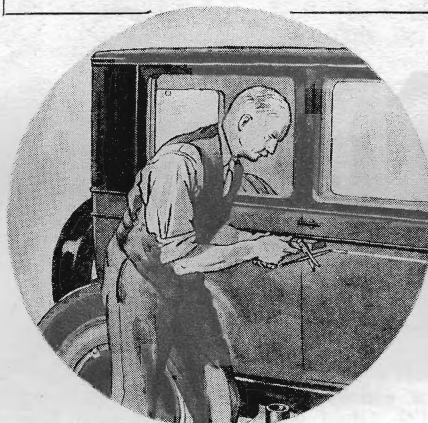


Fig. 3. Amateur auto painters will find this ingenious homemade device a great help in adding a stripe to the finished paint job

Ingenious Auto Striper

A SIMPLE aid for striping a car can be constructed from a block of wood, a wood screw and a clothespin. Fig. 3 shows the device in use. The pin is screwed to the block of wood. By turning the pin and moving the brush in the fork of the pin the location of the stripe with reference to the bead on the panel can be adjusted. The block is slid along the panel with the bead as guide.



Fig. 5. Bucking tractors can be cured by fitting an automatic cutout switch that will break the ignition circuit when the front of the tractor raises itself up off the ground

Extra Curtain Adds Comfort

BY FITTING a curtain around the back of the front seat of the open touring car—with the method illustrated in Fig. 4—you can make the driver as comfortable as he would be in a runabout without at the same time closing in the whole car with the complete set of curtains. It will help to prevent drafts on the back of your neck and will to some extent reduce the force of the wind blowing on the passengers in the back seat, a service for which they will be grateful. In most cases, you will find that the special curtain can be fastened at the sides to the regular curtain fasteners provided on the car. Additional fasteners can be attached to the back of the seat and the top to hold the curtain at these points.

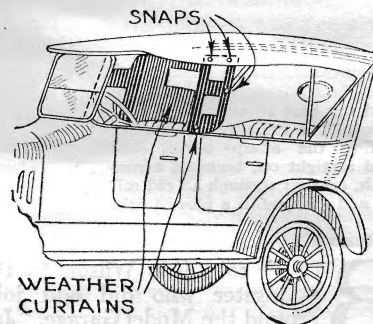
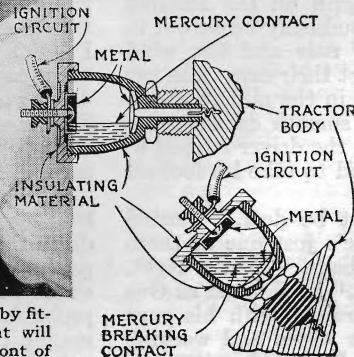


Fig. 4. A special curtain around the back of the front seat in the touring car will add greatly to the comfort of driver and riders

Curbing Unruly Tractors

THE small farm tractor that drives through cleated rear wheels has one bad habit. When an attempt is made to pull a load so heavy that it is near the limit of the pulling power, there is a tendency for the tractor to rear on its hind wheels and if the driver doesn't remove his foot from the throttle quick enough, the tractor may roll over backwards with serious results. This peculiar trouble can be eliminated by adding an automatic cutout switch as shown in Fig. 5. When the switch is horizontal the mercury completes the circuit between



the electrodes, but when the tractor starts to rear up on its hind wheels the mercury flows away from one electrode and cuts off the ignition, thus stopping the engine and eliminating the chance of a serious accident occurring.

Ingenious Kinks for Your Car

Exhaust Melts Windshield Ice—Water Pumps Tires — Secret Ignition Switch — Other Ideas

IN LOCALITIES

where the water supply is delivered to your home at a pressure of fifty or sixty pounds you can arrange to let the water pressure do the work of pumping up your tires. All you need is an old water tank, the larger the better, and a few pieces of piping. Fig. 1 shows how the tank should be set up. Assuming that the tank is empty, when the water is allowed to flow in at the bottom from the supply pipe, the air in the tank is compressed until it equals the water pressure. If you attach the air hose to your tire valve, the compressed air flows into your tire as the water rises in the tank. The float valve is needed only to prevent water being forced into the tire when the air in the tank is all used up. To put the tank in condition for another series of pumpings shut the supply valve and open the drain cock. This allows the water to flow out of the tank and a fresh supply of air rushes in by way of the air hose. Since some pressure is required to overcome the valve spring, you cannot pump a tire up to a pressure exactly equivalent to the water pressure.

Fighting Snow on Windshields

NO WIPER will keep your windshield clear when snow freezes to everything it touches. Then you must apply heat to melt the snow. Fig. 2 shows a homemade hot air heater applied to the exhaust pipe. A funnel arrangement with the opening toward the fan forces air through the stove, up an old vacuum cleaner hose and out the nozzle, also a vacuum cleaner part. The air keeps the glass above the freezing point, enabling the wiper to work. Some experimenting will get the nozzle the right distance from the glass.

Cures Sagging Garage Doors

GARAGE doors, because they are large and heavy, often give trouble. They sag and stick and the pounding re-

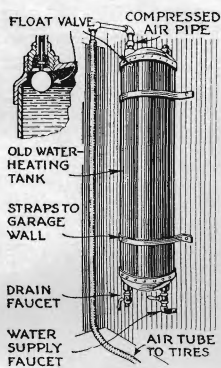


Fig. 1. You can use an old hot-water tank, piped as shown, to give you air pressure for pumping your tires

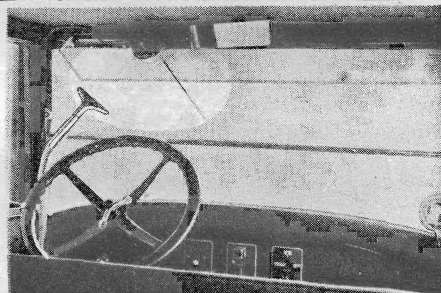
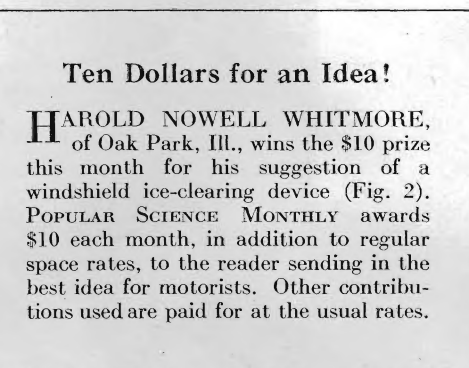


Fig. 2. When sleet or snow begins to stick you need a windshield heater to make driving safe. As shown in this illustration, the windshield is heated by hot air supplied by a special exhaust pipe stove and old vacuum cleaner parts

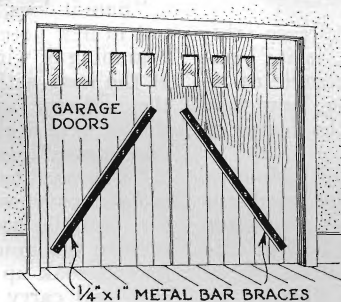


Fig. 3. Metal bar braces bolted to your garage doors, as shown, reinforce the doors and prevent their sagging

metal bars are not easily obtainable, nearly as good results can be got with boards.

Novel Secret Switch

THE value of any secret ignition switch depends on how cleverly it is concealed. The switch shown in Fig. 4 is so constructed that it doesn't look like a switch and can be placed in plain sight if necessary. No one would suspect the wire cleat of harboring a concealed break in the wiring. The cleat can be cut from any

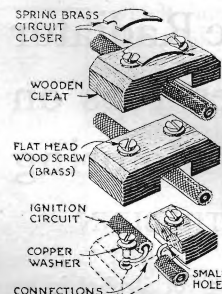


Fig. 4. The particular merit of this secret switch is that it need not be hidden from view. It does not look the part

piece of hard wood. Drill the holes for the two screws and carve a groove for each wire end from the center notch to the screw hole. Then enlarge the screw holes just enough so that small loops can be turned in the ends of the wires and placed in these holes. Use flathead wood screws with copper washers and figure out the size of the enlargement at the bottom of each hole so that when the screw is forced down tight, each wire end will be jammed between the side of the hole and the screw so as to get a good electrical contact. A piece of spring brass cut to snap under the edges of the flathead screws will complete the connection between the wire ends. Of course round-headed screws would ordinarily be used, but anyone noticing the flathead screws is most unlikely to attach particular significance to them. If you install this switch in an old car, dirty the cleat to make it look old.

Several convenient locations for the concealed switch will suggest themselves. Check up the location of the wire running from the timer to the dash switch and then choose the easiest location to get at.

Weatherstripping Your Garage

SECTIONS of old inner tubes tacked along the lower edge of the garage door will help keep the garage warm and prevent fine snow from being blown under the door. Be careful that the tube projects only far enough below the edge to make contact with the ground. If it hangs too far it may get caught and jam the door when it is closed. If the doors fit too loose at top and sides additional sections of inner tube can be nailed to the frame so that the doors will press against them when they are closed.

Doors thus made air-tight will keep the car clean longer after each washing, as they exclude dust.

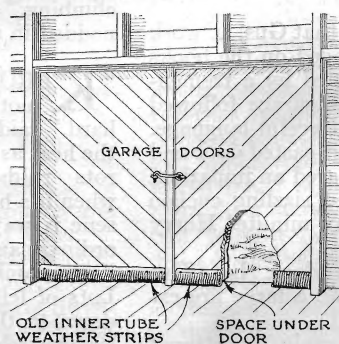


Fig. 5. How sections of old inner tubes weather-strip garage doors